

## AP CHEM ASSIGNMENT SHEET #5

# THE SOLUTION, MY DEAR STUDENT, IS ELEMENTARY

From Chang, read sections 4.1, 4.2, 4.5, 4.6, and 6.7 as well as chapter 12.  
Read the *Chem in Action* on page 143 and the one on pages 530.  
Check out the Chemical Mystery on page 542.

From the APQ packet, please answer questions  
**10 ace, 20, 28 abc, 30, 41, 49 abd, 54 abc, 65 a, and 67 a.**

From pages 157-163, answer questions:

1, 2, 3, 7, 8, 10, 12, 14, 17, 18, 20, 22, 24, 59, 60, 61, 62, 64 (pick a couple), 66 (ditto), 70, 72, 74, 77, 78, 116, 120, 132, 142 (DUI)

From page 258, answer questions 66, 67, 68, and 69.

From pages 534-541, answer the following:

1, 4, 5, 6, 7, 8, 10, 12, 15, 16, 18, 21, 22, 24, 25, 26, 27, 28, 30, 31 (dead fish?), 32, 34 (goldfish), 36 (burp), 38 (the bends), 39, 42, 44, 45, 48, 49, 51, 52, 53, 54, 55, 57, 59, 60, 62, 63, 64, 66, 70, 71, 72, 73, 76, 77, 79, 80 (plasma), 85, 87, 88, 89, 91, 93, 97, 98, 103, 104, 107, 110, 111, 122 (cold fish), 123 (always fun), 124

START TO MEMORIZE THE SOLUBILITY TABLE ON p. 123 of Chang

### The game plan:

1. The solution process and  $\Delta H$  and  $\Delta S$ ; "like dissolves like"
2. Solvation/hydration, saturation, miscibility
3. Solubility; effects of temperature and pressure on solubility
4. Precipitation; ionic and net ionic equations
5. Concentration units: molarity (M), molality (m), mole fraction, % by mass
6. Colligative properties (for nonelectrolytic and electrolytic solutions)

Vapor pressure lowering

Raoult's Law:

If non-volatile solute only  $P_{\text{sol'n}} = (X_{\text{solvent}}) (P^{\circ}_{\text{solvent}})$

If both components volatile  $P_{\text{sol'n}} = (X_{\text{solute}}) (P^{\circ}_{\text{solute}}) + (X_{\text{solvent}}) (P^{\circ}_{\text{solvent}})$

Ideal solution vs. (+) deviation vs. (-) deviation

Boiling point elevation  $\Delta T_B = m \cdot K_B$

Freezing point depression  $\Delta T_F = m \cdot K_F$

Osmotic pressure ( $\pi$ )  $\pi = MRT$

"Complications"

For electrolytic solutions, the van't Hoff factor (i)

For non-electrolytic solutions, dimerization